JULY

Cholesterol Guide

SUSTAINABLE DISH

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Cholesterol is a very important and often confusing topic for people. In this guide, we'll cover basic information about cholesterol, answer common questions, address misconceptions, and give you some actionable items to improve cholesterol and discuss different approaches with your doctor.

This is not medical advice. Always work with your doctor before making any dietary or lifestyle changes.

CHOLESTEROL FAST FACTS

- What is cholesterol? Cholesterol is a type of fat that's found in your blood. It's found in certain foods but also produced by your body, primarily by your liver. Cholesterol is essential for building cell membranes and hormones, and it plays a role in various bodily functions. Cholesterol is carried through the blood by lipoproteins, and these lipoproteins also carry triglycerides, fat soluble vitamins, and antioxidants.
- Only 25% of the cholesterol in your body comes from the foods you eat, while the remaining 75% is produced by your liver and other cells in your body.
- Cholesterol is actually essential to life. Very low cholesterol levels are associated with health problems and increased risk of death.
- It is commonly believed that eating foods high in saturated fat and cholesterol raise blood cholesterol levels; however, for most people, eating saturated fat and cholesterol doesn't raise cholesterol in the blood over the long term. Some people are hyper-responders and will experience an increase in blood cholesterol from saturated fat and cholesterol in their diet.
- Cholesterol itself is neither inherently "good" nor "bad." Instead, it's about where cholesterol is located within the body and how it interacts with other molecules that determines its impact on health. Cholesterol becomes problematic when it accumulates in certain areas, such as within the walls of arteries, leading to conditions like atherosclerosis. However, it plays essential roles in various physiological processes when properly regulated.

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You may have heard that fish oil is helpful for lowering cholesterol, but do you know about the added benefits of Krill oil? Krill are tiny shrimplike crustaceans which contain phospholipids that are better absorbed than fish oil. NativePath Antarctic Krill Oil contains 100mg of phospholipids and 200mcg of Astaxanthin for added antioxidant benefits to further support your joints, heart, circulation, brain and helps to reduce overall inflammation.

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BUSTING COMMON CHOLESTEROL MYTHS

Myth 1: Eating foods high in cholesterol and saturated fat, like meat, raises cholesterol levels in your blood.

Dietary cholesterol typically does not impact blood cholesterol levels. 75% of people experience no change in blood cholesterol levels when they eat cholesterol; the remaining 25% experience a modest increase, but it is unlikely to be clinically significant. For saturated fat, long-term studies show that eating saturated fat doesn't increase cholesterol levels, except for people who are hyper-responders.

Myth 2: Eating foods like red meat and butter, high in cholesterol and saturated fats, causes heart disease.

The majority of studies suggest that eating saturated fat and cholesterol doesn't increase the risk of heart disease even when it does increase blood cholesterol levels. Total and LDL cholesterol levels don't give a very clear picture of heart disease risk. What's more crucial is the number of LDL particles in the blood, rather than just how much cholesterol they're carrying. It is important to look beyond just cholesterol levels when evaluating cardiovascular health, which we will discuss below.

Myth 3: Normal or low cholesterol levels means you are at a lower risk for heart disease.

It's possible to have low or even normal total and LDL-C, but have a high number of LDL particles and thus be at increased risk. As mentioned above, it's important to consider not only total and LDL cholesterol levels but also the number of LDL particles when assessing cardiovascular risk. Additionally, very low cholesterol levels, especially in older individuals, may be associated with increased mortality. This is why it's critical to have a balanced approach to managing cholesterol levels.

WHAT CAUSES HEART DISEASE?

As we just discussed, LDL particle number is a more significant risk factor for heart disease than just LDL cholesterol or total cholesterol levels alone. People with metabolic syndrome and insulin resistance often have higher levels of LDL particle number.

Atherosclerosis, the condition characterized by the buildup of plaque inside arteries, is primarily driven by two key factors:

- **The number of low-density lipoprotein (LDL) particles**: These particles can penetrate the walls of arteries and become oxidized, triggering an inflammatory response that leads to the formation of plaques.
  - The four primary causes of high LDL particle number are:
    1. Insulin and leptin resistance, or metabolic syndrome
    2. Poor thyroid function
    3. Infections, like viral and bacterial infections
    4. Genetic mutations like familial hypercholesterolemia or ApoE4

- **Oxidation of LDL particles**: When LDL particles become oxidized, they become more likely to contribute to the development of atherosclerosis. Oxidation occurs when LDL particles react with unstable molecules called free radicals. This process can occur due to various factors such as inflammation, smoking, high levels of certain fats in the diet, and metabolic disorders like diabetes. When LDL becomes oxidized, it can become more harmful to the arteries, promoting inflammation and contributing to the formation of plaque. Oxidized LDL is considered a key player in the development of cardiovascular diseases such as coronary artery disease, as it contributes to the narrowing and hardening of the arteries, increasing the risk of heart attacks and strokes. Therefore, reducing the oxidation of LDL through lifestyle modifications and medical interventions is an important strategy for preventing cardiovascular disease.

Determining Your Risk of Heart Disease

There's a lot of information when it comes to lipid testing, so I want to give you some context and also discuss some of the limitations and shortfalls of the standard lipid profile that your doctor probably orders for you.

Standard lipid testing typically includes measurements of total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides. While this provides valuable information about a person's lipid profile and cardiovascular health, there are several limitations or shortfalls associated with standard lipid testing:

- **Incomplete risk assessment**: Standard lipid testing focuses primarily on cholesterol levels and does not capture other important risk factors for cardiovascular disease, such as inflammation, oxidative stress, and the number of LDL particles. These factors can significantly impact cardiovascular risk but are not typically assessed in standard lipid panels.
- **LDL particle size**: Standard lipid testing does not differentiate between different subtypes of LDL particles, such as small, dense LDL particles, which are more atherogenic (more likely to contribute to plaque buildup) than larger LDL particles. Therefore, someone with predominantly small, dense LDL particles may have a higher cardiovascular risk even if their LDL cholesterol levels are within the normal range.
- **Variability**: A single lipid panel may not provide a comprehensive assessment of an individual's long-term cardiovascular risk, as it represents only a snapshot in time and there is tremendous variability from reading to reading on cholesterol tests. I recommend getting tested at least twice before coming to the conclusion that your cholesterol is high.
- **Outdated standards**: Studies of traditional peoples with no heart disease have determined that a normal total cholesterol level ranges from 140 to 250 mg/dL, which means that the current cutoff of 199 mg/dL may be too low.

Several additional tests can provide valuable information for assessing the risk of heart disease beyond standard lipid testing. Some of these tests include:

- **High-Sensitivity C-Reactive Protein (hs-CRP)**: This blood test measures levels of C-reactive protein, a marker of inflammation. Elevated hs-CRP levels are associated with an increased risk of cardiovascular events, independent of traditional risk factors.
- **Lipoprotein(a) [Lp(a)]**: Elevated levels of Lp(a) are associated with an increased risk of coronary artery disease and aortic stenosis. This test may be particularly useful in individuals with a family history of premature cardiovascular disease.
- **Coronary Calcium Score (CAC)** is a scan to detect the presence and extent of calcium deposits in the coronary arteries. However, calcium scoring has several problems associated with it and may increase the risk of cancer, so it's not recommended.
- **The Reynolds Risk Score** is superior to the Framingham Risk Score for estimating your 10-year risk of heart attack.
- Some other tests that can provide useful information include iron panel plus ferritin, hemoglobin A1c, and post meal blood sugar.

Optimize electrolytes for heart health

Electrolytes help send the signals that tell the heart to beat. Consuming fewer than 3 grams of sodium per day is associated with *higher* rates of adverse cardiovascular events and death. Magnesium helps regulate heartbeat, relax blood vessels, and may reduce inflammation. Adequate potassium intake can also improve hypertension by relaxing blood vessel walls.

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Recommended Tests & Ranges		
Test	**Range**	**Comments**
LDL Particle Number (LDL-P)	Low: <1,000 Moderate: 1,000–1,299 Borderline high: 1,300–1,599 High: 1,600–2,000 Very high: >2,000	NMR is gold-standard; ApoB:ApoA1 ratio is roughly comparable, but not as accurate
Lipoprotein(a)	Optimal: <14 mg/dL Borderline: 14–30 mg/dL High: >30 mg/dL	Lowering Lp(a) has not been shown to reduce the risk of heart disease
hs-CRP	Low risk: <1.0 Moderate risk: <1.0–3.0 High risk: >3.0	Do not test during active infection; not an accurate marker for people with systemic inflammatory disease; must test 2-3 times to get an accurate average
Lp-PLA2 (aka PLAC Lp)	High risk: >200 ng/ml	More specific marker for cardiovascular inflammation than CRP
DNA testing for FH	Depends on marker and methodology of testing	Simon Broome criteria can be used as alternative method of diagnosis when DNA testing not available
Hemoglobin A1c	Low risk: <5.5% Moderate risk: 5.5–6.5% High risk: >6.5%	Not an accurate marker in some individuals; affected by red blood cell turnover, anemia, dialysis, and other conditions
Post-meal blood sugar	Optimal: <140 mg/dL 1-hour post-meal <120 mg/dL 2-hours post-meal	Use glucometer to test
Iron panel: UIBC	<150 ug/dL indicates iron overload	Re-test to confirm
Iron panel: iron saturation	>50% indicates iron overload	Re-test to confirm
Iron panel: ferritin	Optimal (men): <150–200 ng/mL Optimal (women): <125 ng/mL	Elevated ferritin may indicate inflammation rather than iron overload
Metametrix Microbial Ecology Profile (test #2105)	Follow the lab interpretation	Note that "parasite present: taxonomy unavailable" usually indicates a non-human colonizing pathogen and does not require treatment

High cholesterol alone isn't a perfect marker of heart disease risk because it doesn't capture the full picture. While elevated levels of LDL cholesterol are associated with increased risk, other factors play significant roles. For instance, the number of LDL particles matters more than just the cholesterol amount they carry. Additionally, high cholesterol doesn't always reflect the overall health of blood vessels or the presence of inflammation, which are crucial factors in heart disease development. Therefore, while cholesterol levels are essential to monitor, they should be considered alongside other risk factors for a more comprehensive assessment of heart disease risk.

Additionally, we need to consider dietary and lifestyle factors, since we do not have data that accounts for this. So, if you do have an elevated particle number, it's definitely something to pay attention to, but keep in mind that you can't compare your risk if you follow a nutritious diet and healthy lifestyle to the majority of the sedentary population eating the Standard American Diet.

A HOLISTIC APPROACH TO HIGH CHOLESTEROL LEVELS

Like many cases in conventional medicine, the approach to high cholesterol can be oversimplified with possible negative consequences. High cholesterol is a symptom of an underlying problem, rather than a disease to be diagnosed and treated without investigating the cause. While cholesterol-lowering drugs may be necessary for some people, the first step should always be addressing any potential root causes with dietary and lifestyle interventions.

Here are some tips for diet, lifestyle, and supplementation:

Diet:

- Prioritizes nutrient dense whole foods and a balance of traditional fats and avoids processed and refined foods.
    - People with insulin resistance and metabolic syndrome will likely do better with a low carb diet, with less than 50 grams of carbohydrate per day. That said, some studies suggest other approaches may also be effective in this population—ultimately the amount of weight lost is more important than the amount of carbs or fat consumed.
    - People with familial hypercholesterolemia and normal triglyceride and HDL levels may do better on a moderate carb diet, lower in saturated fat and higher in monounsaturated fat than a low carb paleo diet.

- Emphasis on coldwater fatty fish and shellfish, antioxidant rich foods, polyphenol rich foods, fermented foods, and soluble fiber.
- Limited alcohol consumption.

Lifestyle:

- Exercise: Avoiding a sedentary lifestyle helps reduce the risk of heart disease and improve lipid profiles. Remember, more is not always better, since stress management is also critical. nutrient dense whole foods and a balance of traditional fats and avoids processed and refined foods.
- Stress management: This is an integral part of any heart disease prevention lifestyle. Chronic stress is one of the most significant, yet least recognized risk factors for heart disease. Incorporate stress management techniques like meditation, breathwork, exercise, and therapy.

Supplementation:

- Prioritize nutrients from food, but use high quality supplements as needed. If you are looking for a great multivitamin, Adapt Naturals Bio Avail Multi is my favorite one!
- The micronutrient supplements recommended for everyone who are concerned with heart disease prevention are:
  - Fat soluble vitamins like A, D, and K2
  - Vitamin C
  - Magnesium

Recommended Tests & Ranges		
Supplement	**Dosage**	**Considerations**
Vitamin A	10–15,000 IU/day	Best obtained in whole-food for from high-vitamin cod liver oil (CLO); make sure CLO is cold-pressed and contains naturally-occuring vitamins
Vitamin C	500 mg–1 g/day	Whole-food forms made from acerola cherries, rose hips, etc. are best absorbed and utilized
Vitamin D	Enough to maintain serum level of 35–60 ng/mL	A combination of whole-food vitamin D (such as CLO) with cofactors and enzymes required to absorb it and exposure to sunlight should form the foundation of your vitamin D plan; some peopl may need additional synthetic D3 to bring their levels into the desired range; liquid forms are better absorbed than capsule forms
Vitamin K2	1 mg/d of MK-4 form	Can be obtained from gras-fed dairy and some organ meats; however, those at moderate to high risk of heart disease should supplement with 1 mg/d of the MK-4 form (the MK-7 form has not been shown to have the same benefits); avoid products with high doses of vitamin K1 in them
Magnesium	400–800 mg/day	From a combination of food (such as homemade bone broth) and supplements. Chelated forms of magnesium glycinate and magnesium malate are better absorbed and tend to have fewer side effects

What You Should Know About Statins

A discussion on high cholesterol wouldn't be complete without information on statins. If you have ever had high cholesterol, your doctor has probably talked to you about statins.

Statins are a class of medications primarily used to lower cholesterol levels in the blood. They are commonly prescribed to reduce the risk of cardiovascular events such as heart attacks and strokes, especially in individuals with high cholesterol levels or those at increased risk of cardiovascular disease.

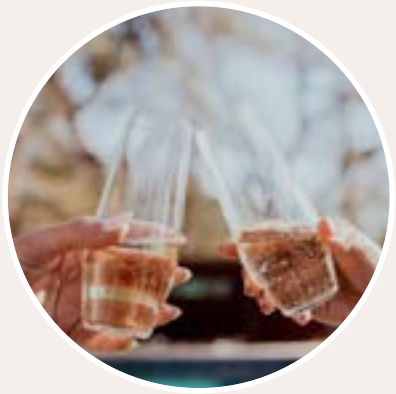
Statins work by inhibiting an enzyme called HMG-CoA reductase, which plays a key role in the production of cholesterol in the liver. By blocking this enzyme, statins reduce the liver's ability to produce cholesterol, leading to lower levels of LDL cholesterol in the bloodstream.

Here are some quick facts you should know about statins:

- The only population that statins have been shown to extend life in are men under 80 years of age with pre existing heart disease.
- Statins have been shown to cause a number of side effects such as muscle pain and cognitive problems.
- CoQ10 and vitamin D may decrease the risk of side effects. Supplemental selenium is not recommended because it may decrease the efficacy of statins.
- Low dose statins have fewer side effects than high dose statins.

Having a heart attack or other cardiovascular event can have a significant impact on quality of life, so this medication can be a crucial tool in some individuals' health care plan.

Natural Wine is a key to longevity



Polyphenols work together to protect your cells, so consuming a wide variety of polyphenols is more important than getting a lot of any single one. Because Natural Wine contains a broad diversity of these vibrant compounds, a glass a day helps build a strong foundation. That's why I became a Member of Dry Farm Wines. ALL the wines from Dry Farm Wines meet very strict purity criteria. Every bottle of wine has a unique collection of dozens (sometimes hundreds) of different polyphenols.

And when you start a membership, you can get a bottle of their fabulous wine for just a penny!

NATURAL WAYS TO REDUCE CHOLESTEROL

Here are some foods and supplements that have been shown to reduce cholesterol and improve other biomarkers associated with heart disease.

- Red yeast rice has the most potent cholesterol lowering effect. It should be considered as a low-dose statin and used under a physician's supervision.
- Niacin has several beneficial effects and has been shown to lower the risk of heart disease, but it has many side effects.
- While CoQ10 does not lower cholesterol, it may protect against oxidative damage and reduce statin side effects when taken in the proper form.

There is no one size fits all approach to heart disease prevention, but I hope this information leaves you feeling more confident in your knowledge of lipid testing, heart disease risk, and holistic approaches to managing cholesterol levels.

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SUSTAINABLE DISH

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Diana Rodgers, RD, is a "real food" nutritionist and sustainability advocate near Boston, Massachusetts. She's an author of three books, runs a clinical nutrition practice, hosts the Sustainable Dish Podcast, and has served as an advisory board of numerous nutrition and agriculture organizations including Whole30, Animal Welfare Approved and Savory Institute. She speaks internationally about the intersection of optimal human nutrition and regenerative agriculture.

Diana is co-author of, Sacred Cow: The Case for (Better) Meat and the director, producer of the companion film, Sacred Cow. Her new initiative, the Global Food Justice Alliance, advocates for a nutritious, sustainable and equitable worldwide food system.

▸ Learn more at www.globalfoodjustice.org